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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,567	05/03/2005	Kazunari Domen	TAN-351	4563
63479 7590 02/04/2009 HAHN & VOIGHT PLLC 1012 14TH STREET, NW SUITE 620 WASHINGTON, DC 20005				
EXAMINER				
SMITH, JENNIFER A				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
02/04/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/533,567

**Applicant(s)**

DOMEN ET AL.

**Examiner**

JENNIFER A. SMITH

**Art Unit**

1793

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 November 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3,5,10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,10 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S5108)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Status of Application***

Claim 1 has been amended.

Claims 2, 4, 6-9, 11, and 13-14 have been canceled.

Claims 1, 3, 5, 10, and 12 are presented for examination.

### ***Withdrawal of Claim Rejections***

Claims 1, 3, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (CSJ, 2002) in view of Takagaki et al. (2002).

Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (CSJ, 2002) in view of Takagaki et al. (2002) and further in view of Hara et al. (2002).

### ***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

**Claims 1, 3, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagaki et al. (2002).**

Takagaki et al. teaches 2-dimensional metal oxide sheets composition of  $\text{HTiNbO}_5$  or  $\text{HTi}_2\text{NbO}_7$  in Abstract or  $\text{H}_{0.9}\text{Ti}_{0.9}\text{Nb}_{1.1}\text{O}_5$  in Section 3, Results and conclusion. The Ti/Nb atomic ratio (z) in these cases, respectively, is 1, 2, and 0.818. "x" is 1, 2, and 0.9 and "y" is 1, 1, and 1.9. Takagaki et al. teaches a catalyst composition in Section 2 and 3, Results and conclusion. The Ti/Nb atomic ratio (z) in this case is ranges from 0.833 to 5.

Claim 1 contains process limitations in a composition claim – as such, they are given little weight. The claimed product appears to be the same or similar to that of the prior art, although produced by a different process. The burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. See *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983).

The teachings of Takagaki et al. and the claims differ in that Takagaki does not teach the exact same proportions as recited in the instant claims. The invention is broadly disclosed in the Takagaki reference, however it is noted that there is no exemplified embodiment.

However, one of ordinary skill in the art at the time the invention was made would have considered the invention to have been obvious because the compositional proportions taught by Takagaki et al. overlap the instantly claimed proportions and

therefore are considered to establish a prima facie case of obviousness. In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976). See MPEP 2144.05 I. One would have been motivated to modify this ratio because investigation of changes in catalytic activity associated with changes in atomic ratios has been conducted in the past [See the Introduction of Takagaki]. The Takagaki reference discloses the relationship between the Ti/Nb ratio and the structural features and acidic properties of the catalyst [See Takagaki, 2nd Paragraph]. It is within the level of one of skill in the art to adjust this ratio to reach a level of desirable acidity when used as a catalyst in ester reactions [See Paragraph 1]. It would have been obvious to one of ordinary skill in the art to select any portion of the disclosed ranges including the instantly claimed ranges from the ranges disclosed in the prior art reference, particularly in view of the fact that;

“The normal desire of scientists or artisans to improve upon what is already generally known provides the motivation to determine where in a disclosed set of percentage ranges is the optimum combination of percentages”, In re Peterson 65 USPQ2d 1379 (CAFC 2003). Also, In re Geisler 43 USPQ2d 1365 (Fed. Cir. 1997); In re Woodruff, 16 USPQ2d 1934 (CCPA 1976); In re Malagari, 182 USPQ 549, 553 (CCPA 1974) and MPEP 2144.05.

In regard to claim 3, Takagaki et al. also teaches the organic ammonium used in the catalyst production process to be tetrabutylammonium in Section 2. Claim 3 contains process limitations in a composition claim – as such, they are given little weight.

Claim 10 is drawn to an ester dehydration condensation catalyst comprising the catalyst of claim 3. Claim 10 is obvious over the prior art of record. Takagaki et al., in Section 3, teaches a higher activity in esterification reaction with the titanium niobate oxide sheet aggregate than with zeolite or hydrous niobic acid. Takagaki also gives motivation to modify the invention saying when the composition of  $\text{HTiNbO}_5$  is changed, acid catalytic activity is changed along with the change of composition.

**Claims 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagaki et al. (2002) in view of Hara et al. (2002).**

In regard to claim 5, Tawagaki et al. fails to teach a surface area. Claim 5 contains process limitations in a composition claim – as such, they are given little weight.

Hara et al., in Section 2, teaches preparation of the catalyst  $\text{HTiNbO}_5$  in an aqueous solution of tetrabutylammonium and with a 0.1M solution of nitric acid. The nano-sheet material has 150 times larger surface area of  $150 \text{ m}^2/\text{g}$  compared with that

of before removal. One of skill in the art would expect to obtain the same value from the solid acid catalyst taught in the Takagaki reference because they are made by substantially similar processes.

Claim 12 is drawn to an ester dehydration condensation catalyst comprising the catalyst of claim 5. Claim 12 is obvious over the prior art of record – Takagaki, and Hara. Takagaki et al. Section 3, teaches a higher activity in esterification reaction with the titanium niobate oxide sheet aggregate than with zeolite or hydrous niobic acid. Furthermore, this claim 12 recites the intended use of the claimed invention. This must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim.

### ***Response to Arguments***

Applicant's arguments filed 11/20/2008 have been fully considered. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

Applicant's arguments with respect to the prior art rejections over the Yoshida et al. reference have been fully considered and are persuasive. The arguments are moot in view of the new ground(s) of rejection. Applicant argues the Yoshida et al. reference does not describe a catalyst in which "z" has a value between 1.2 and 1.4. Upon further

consideration, a new ground(s) of rejection is made. Takagaki et al. is the closest prior art on record in view of Applicant's amendments to the range of the "z" value.

Applicant argues the Takagaki reference teaches away from the claimed invention. The invention is broadly disclosed in the Takagaki reference, however it is noted that there is a lack of exemplified embodiments, Ti/Nb ratio 0.833 being the only specific example given. However, one would have been motivated to modify this ratio because investigation of changes in catalytic activity associated with changes in atomic ratios has been conducted in the past [See the Introduction of Takagaki]. The Takagaki reference discloses the relationship between the Ti/Nb ratio and the structural features and acidic properties of the catalyst [See Takagaki, 2nd Paragraph]. It is within the level of one of skill in the art to adjust this ratio to reach a level of desirable acidity when used as a catalyst in ester reactions [See Paragraph 1].

Applicant argues the range taught by Takagaki et al. (0.833 to 5) relies on different compounds in the form of the salt of Cs or K. In this case the activities of the solid acid catalysts are disclosed based on the ratio of titanium to niobium and catalyst function is not drawn to the hydrogen, cesium, or potassium components.

### ***Conclusion***

Claims 1, 3, 5, 10, and 12 are rejected.

No claims are allowed.



Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. SMITH whose telephone number is (571)270-3599. The examiner can normally be reached on Monday - Friday, 8:30am to 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENZO/  
Supervisory Patent Examiner, Art Unit 1793

Jennifer A. Smith  
January 29, 2009  
Art Unit 1793

JS